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U S A M I C O M

Program Directive and Protocol

On

REMOTE PERTURBATION TECHNIQUES (S)

CLASSIFIED BY:
C, STRAT BMD & STRAT ADM SYS DIV

REVIEW ON:
28 JUNE 1999

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CONTENTS

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PROPOSED GRILL FLAME PROTOCOL: TASK II
PROPOSED DARCOM PROTOCOL FOR RESEARCH ON REMOTE PERTURBATION TECHNIQUES

I INTRODUCTION

A. General

This protocol contains the procedure for DARCOM research on remote perturbations. It is to remain in effect until the completion of Task II. The term "remote perturbation (RP)" is used herein to signify an intellectual/mental process by which a person perturbs remote sensitive apparatus or equipment. RP does not involve any electronic sensing devices at, or focused on, the RP agent. No drugs, hypnosis, special sensory (visual, auditory or olfactory) or proprioceptive stimuli, liminal, or subliminal, electrical, or electromagnetic will be used in this protocol.

1. Military Objective

It is the objective of this protocol to determine whether targeted sensitive electronic equipment can be perturbed as a result of RP activity.

2. Military Applications

RP offers the potential for remote man/machine interactions with computers, locks, switches, codes, and other sensitive or delicate

mechanical or electronic apparatus, barred or held secure from ordinary physical contact or intervention.

3. Approval History

The commander, U.S. Army Materiel Development and Readiness Command (DARCOM) approved in principle the U.S. Army involvement in what is now known as project GRILL FLAME in April 1978. In May 1978, the Assistant Chief of Staff for Intelligence (ACSI) accepted lead responsibility for GRILL FLAME applications. Overall DoD responsibility resides with the Defense Intelligence Agency (DIA).

4. Project Officers

The overall, responsible individuals for all aspects of the project are Mr. Billy Jenkins, Missile Research and Development Command; and Mr. John Kramer, Army Materiel System Analysis Agency.

B. Data Base for RNG Experiments

1. Early Experiments

In 1970, H. Schmidt reported[2] that he had observed significant perturbations by psychoenergetic means, of an otherwise binary (0, 1) random sequence that was derived from the beta decay of strontium 90 ^{90}Sr. The binary sequence was produced by the random interruption of a high speed binary electronic clock when an electron from the ^{90}Sr decay was detected. The sequence generation rate was approximately 1/s.

In this experiment individuals were asked to focus their attention on the electronic system by remote viewing the noise source, and monitoring any effects that occurred by watching the random walk of a display light feedback system. (A circular array of lights was used to indicate the state of the interrupted clock by advancing the position of the activated light clockwise for each logical "1" and counterclockwise for each "0".)

When individuals focussed their attention on the apparatus the resulting binary (0, 1) sequence was found to contain only 49.1% 1's. Since the total sequence had a length of over 32,000 bits, the deficit of 1's was highly significant. The probability of such a result occurring by chance is less than one in a thousand. Furthermore, during extensive control runs when no individual was focusing his attention on the electronic hardware, the system performed according to the usual binomial statistic,

and showed no statistical effect. Appendix A contains the original paper describing this experiment.

2. Total RNG Data Base

As of 1978, a total of 54 experiments of this type had been reported in the literature (see Table 1). Of these, 35 reported significant departure from chance expectation, and none reported similar effects during control runs. We can summarize the data base generated in these experiments as follows:

- The generation rate extended from a few per second to 300 per second.
- The sequence lengths varied from 10^3 to 10^5 bits.
- Beta decay and thermal noise were used as sources of randomness.
- The effects (deviation from 50% chance expectation) were on the order of 1% to 5%.
- Control runs did not yield results which differ significantly from chance expectation.

As an overall evaluation of the data base, it is unlikely that the apparent RP effect is simply an artifact of selected reporting by the laboratories involved; even if one were to assume that there were 10 unreported non-significant experiments for each reported significant one, the entire expanded data base would still show significant effects with odds against chance of better than 2000:1.

3. Critique of Data Base

There are, however, two characteristics of this data base which pose problems. First, the effects are rarely stable with one individual's RP effort, the quoted results being averages over a number of individuals. Secondly, the physical environment of the noise sources and associated

Table 1

RANDOM NUMBER GENERATOR EXPERIMENTS--DATA BASE

Author (reference)	Comments	Level of Significance
Schmidt (3)	Preliminary experiment	n.s.
	Main experiment	0.00087
Schmidt (4)	1st cat series	0.016
	2nd cat series	n.s.
	1st roach series	0.0069
	2nd roach series	1.2×10^{-4}
Schmidt & Pantas (5)	Preliminary experiment	0.012
	Series I	6.3×10^{-5}
	Series II	0.0093
Matas & Pantas (6)		0.0014
Andre (7)	Experiment I	0.11
	Experiment II	0.009
Honorton & Barksdale (8)	Group series	0.034
	Individual Ss	n.s.
	Selected subject	3.4×10^{-6}
Schmidt (9)	Exploratory experiment	5.6×10^{-6}
	Confirmatory experiment	2.1×10^{-8}
Bierman & Houtkeeper (10)		0.026
Schmidt (11)	Experiment I	
	Series 1	0.001
	Series 2	0.001
	Series 3	0.001
	Experiment II	
	Real-time	0.05
	Prerecorded	0.0005
	Experiment III	n.s.
Stanford & Fox (12)		0.05
Stanford, et al (13)		0.0069
Braud, et al (14)	Experiment I	0.002
	Experiment II	0.05
	Experiment III	n.s.

Table 1 (concluded)

Author (reference)	Comments	Level of Significance
Honorton & May (15)		0.035
May & Honorton (16)		0.011
Millar & Broughton (17)		n.s.
Millar & Mackenzie (18)		n.s.
Millar (19)		n.s.
Honorton & Winnett (20)	Meditator	0.018
Winnett & Honorton (21)	Meditators	0.0024
Braud & Hartgrove (22)	Meditators	0.034
Broughton, et al (23)		n.s.
Braud (24)	Experiment 1	0.028
	Experiment 2	0.022
	Experiment 3	n.s.
	Experiment 4	0.044
Schmidt (25)	Expt. I (prerecorded)	0.00037
	Expt. II (prerecorded)	n.s.
Terry & Schmidt (26)	Condition A	0.04
	Condition B	n.s.
Jungerman & Jungerman (27)	Experiment 1	n.s.
	Experiment 2	n.s.
Davis & Morrison (28)	Experiment 1	n.s.
	Experiment 2	n.s.
	New procedure	n.s.
Braud & Braud (29)	Experiment 1	n.s.
	Fbk	0.05
	No fbk	0.05
	Experiment 2 (no fbk)	0.05

electronics was not discussed in any detail for any of the experiments, so it is possible that some of the effects may be the result of normal and possibly subtle electronic interference.

We intend to address these two problems by first focusing our attention upon a limited number (9 or less) of participants who have shown previous expertise as remote viewers. By using experienced remote viewers, it is anticipated that we should observe an effect within this limited number, rather than having to average over large numbers of individuals as in the data base experiments. Also, by using more sensitive analysis techniques than have been used previously, even a small effect can be stabilized.

Secondly to assure ourselves that the noise sources are sufficiently free of even subtle (but normal) electronic nonrandomness, we intend to use the rigorous construction and design techniques possible (battery power, optically coupled signals, etc.) to isolate the sources from normal environmental influences. Furthermore, the noise sources will be chosen for their internal simplicity[30] and thus may be amenable to realistic mathematical modelling. Using the models, we are able to calculate by Monte Carlo techniques a noise source's dependence on various external and internal physical parameters.

C. Scientific Merits

If it is possible to have a stable remote perturbation source and detection system, no matter how small the effect, we would be able to investigate the nature of this interaction in a most straightforward manner. For example, distance effects could be accurately determined simply by doing experiments as a function of participant/device separation distance which in principal could range as far as interplanetary distances if necessary. Shielding and other effects could be investigated by placing the detection system in various environments. Most importantly, we could investigate the relation (if any) between remote viewing and remote perturbation. Some relation might be expected since in ordinary physical interactions information about the state of a system can be obtained only

by way of some interaction with the system, which in some cases is supplied by the observer. We might therefore expect an observable dependence between RV and RP under certain conditions.

D. Technical Application

Using the proper analysis procedure, even a very small effect can be made to operate a mentally-activated switch with arbitrarily high reliability.

II EXPERIMENTS

A. General

We intend to replicate the type of experiments that are represented by the data base discussed in the previous section. These experiments are to be carried out however, under conditions more rigorously controlled. As with the earlier experiments, our proposed experiments contain three basic elements:

(1) Noise sources--β decay, noise diode.

(2) Analysis and recording techniques--LSI-11, floppy-disk-based microcomputer.

(3) Feedbank display--video system.

In this section we describe the assumptions and the independent and dependent variables that are implied in such an experiment. This section also contains an outline of the hardware and software components of the complete random number generator system.

B. Assumptions

The characteristics of this hypothesized remote perturbation process are completely unknown. The data base suggests that the putative effect is quite small, so it is reasonable to make a few assumptions about our experiments: (1) the analysis hardware (LSI-11 microcomputer), the recording device (floppy disk system), and the display devices (computer-driven video monitors) are to first order assumed to be stable against remote perturbation processes, the effect being assumed to be isolated within the random noise sources exclusively (an assumption that can be checked during the course of experimentation); (2) the source of the remote

pertubation is assumed to be the human participant. Evidence to date tends to support these assumptions.

C. Independent Variables

There are three primary independent variables that may be varied during the course of the investigation:

(1) Participant/no participant.

(2) Source variation (beta decay, noise diode, pseudo random).

(3) Feedback display variation.

D. Dependent Variables

There is only one dependent variable, namely the output of the statistical analysis of the binary bit stream derived from the noise source.

E. Hardware

An electronic instrument that is designed to be sensitive to remote pertubation processes contains three basic elements: sources of randomness, an analysis capability, and a feedback mechanism. We propose to integrate these components with our existing Digital Equipment Corporation LSI-11/2 microcomputer system. Figure 4 shows a block diagram for such a system.

1. Random Sources

We will consider three types of random sources: an electronic noise disk, a radioactive (beta) decay source, and a pseudo-random feedback shift register.

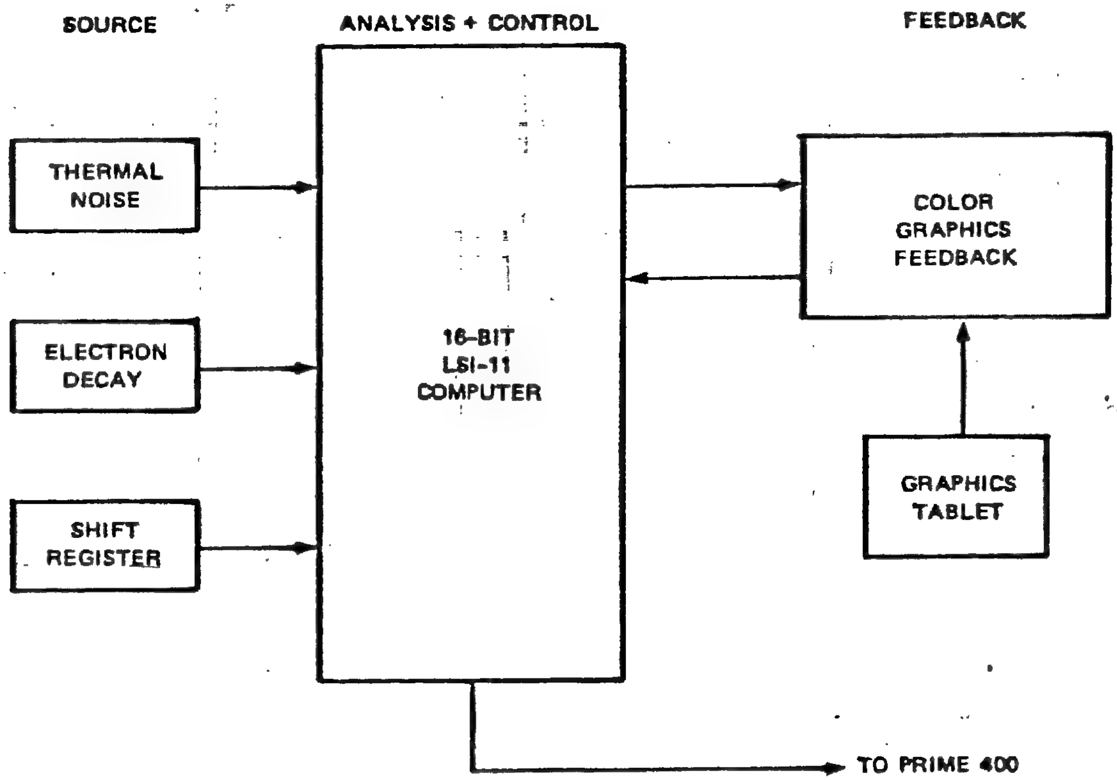

FIGURE 4 BLOCK DIAGRAM OF A COMPUTER-BASED INSTRUMENT DESIGNED TO BE SENSITIVE TO REMOTE PERTURBATION PROCESSES

a. Electronic Noise Diode

In a preliminary design effort carried out in another program, we have determined a suitable electronic noise diode. The diode, first constructed by Haitz,[30] is well understood from the quantum mechanical point of view.

b. Radioactive Beta Decay Source

We propose to design a binary noise source derived from the beta decay of carbon 14 (^{14}C) and prometheum 147 (^{147}Pr). We have chosen these isotopes since they are 100% beta emitters with no competing decay modes, and thus provide a simple radioactive decay spectrum. To insure isolation from spurious power line transients we plan to use battery-operated

surface barrier detector with charge-sensitive preamplifier and associated shaping circuitry to produce the random binary noise signal. This and the electronic noise source will be optically coupled to the LSI-11.

c. Pseudo-Random Shift Register

To act as a control noise source we will optically couple a standard pseudo-random shift register to the LSI-11. The binary output of such a device has the property that although the sequence meets a number of criteria for randomness, the sequence is deterministic, once the starting seed for the register is given.

2. Analysis

The analysis and control portion of the system consists of an existing project LSI-11 microcomputer. To obtain an input, the LSI-11 is programmed to sample one of the noise sources at a specified rate to obtain its random bits. A sequence of such samples is tested by the LSI-11 for an excess or deficiency of 1's on a continuous basis, using a sequential analysis statistical technique.[31,32] The sequential analysis technique is an extremely efficient technique for determining whether the output of the binary random generator contains a distribution of 0's and 1's as expected for an unperturbed source, or is distorted due to, say, RP influence. The principal advantage of the sequential sampling technique as compared with other methods is that, on average, fewer bits per final decision are required (roughly 50%) for an equivalent degree of reliability.

Before we are able to detect that the random output of the binary generator has been distorted, we must *a priori* define how much distortion we require to conclude that there is an effect, and what statistical risks we are willing to accept for making an incorrect decision as to whether the disturbation under consideration is indeed distorted.

To meet these criteria sequential analysis requires the specification of four parameters to determine from which of two binomial distributions under consideration (distorted or undistorted) a data sample belongs. The four parameters are: p_o, the fraction of 1's expected in an undistorted distribution (e.g., 50%); p_1, the fraction of 1's assigned a priori to define a distorted distribution (e.g., 60%); α, the a priori assigned acceptable probability for concluding that the random source is perturbed (p_1 distribution) when in fact it is not perturbed, i.e., the correct distribution is the p_o one (Type I error); β, the a priori assigned acceptable probability for concluding that the random source is unperturbed (p_o distribution) when in fact it is perturbed (p_1 distribution), i.e., the correct distribution is the p_1 one (Type II error). With the parameters thus specified, the sequential sampling procedure provides for construction of a decision graph as shown in Figure 5. The decision graph gives a rule of procedure for making one of three possible decisions following the sampling of each bit: continue sampling before making a decision (Region I in Figure 5); label the sequence as undistorted; label the sequence as distorted (Region III).

Sampling rules can be defined for the <u>nth</u> sample:

(1) Sample the binary sequence

(2) Sum the numbers of 1's to date

(3) If the sum of 1's lies in Region I then do Step (1).

(4) If the sum lies in Region II, stop the run, concluding that the binary sequence is derived from the undistorted p_o distribution.

(5) If the sum lies in Region III, stop the run, concluding that the binary sequence is derived from the distorted p_1 distribution.

Utilization of the above statistical procedure permits analysis of the binary noise sequence for excess 1's or 0's by the most efficient technique currently possible.

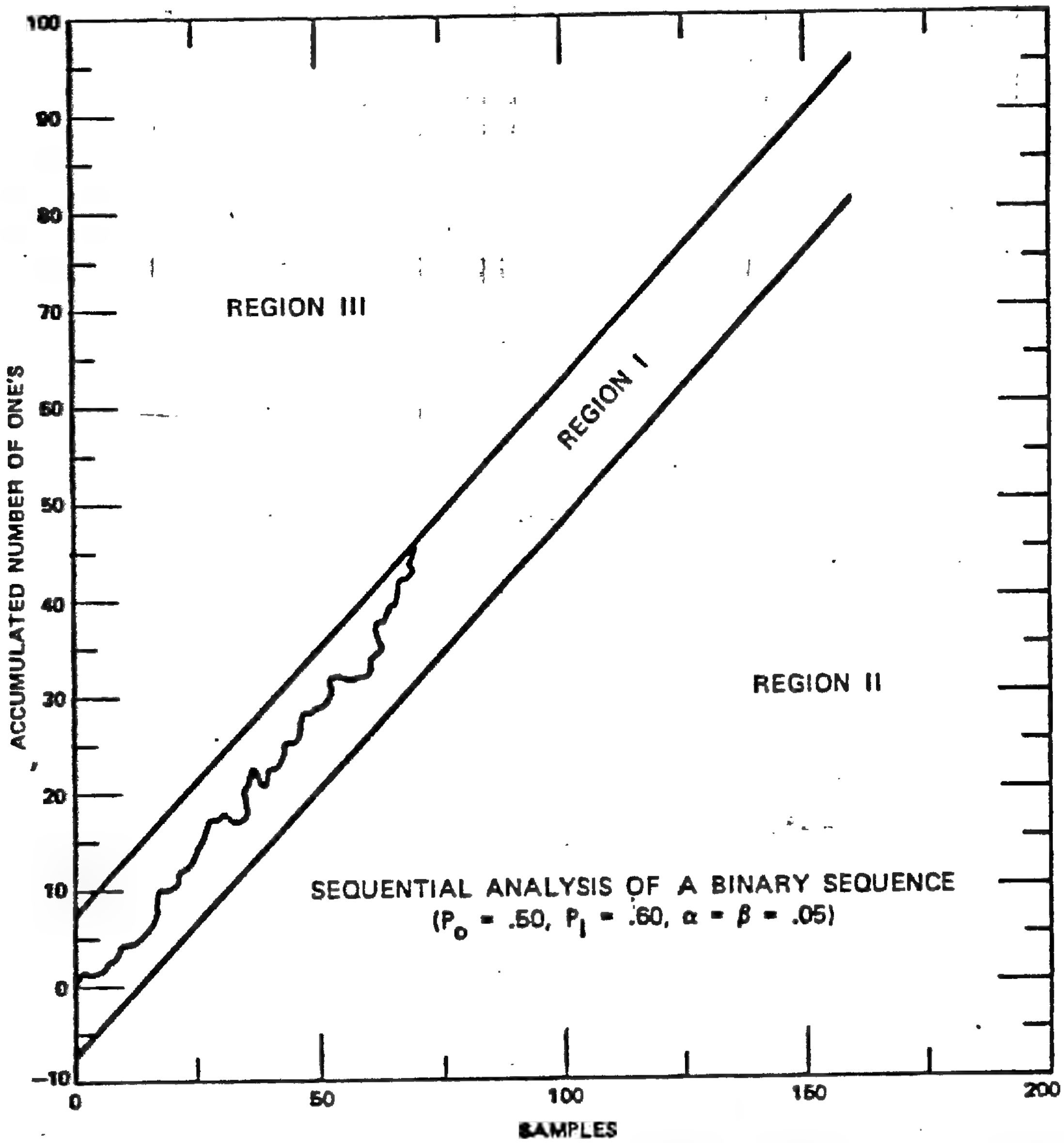

FIGURE 5 IF THE ACCUMULATED NUMBER OF 1's ENTERS REGION III, THE SEQUENCE IS ACCEPTED AS PERTURBED. If it enters Region II, the sequence is accepted as unperturbed, and no decision is made while the accumulated number of 1's remains in Region I.

3. Display

The feedback display to the participant consists of two independent color video channels. The output from the computer analysis of the binary bit stream will "drive" some interesting aspect ot the video image. The second channel may be connected to a video recorder for later off-line analysis.

4. Hardware Redundancy

Using a computer system such as the one described above as a possible detector of remote perturbation, it is important to have as much hardware redundancy as possible. Particularly in the areas of data recording and feedback display. As was stated above, the most likely assumptions for experiments of this type are that the recording and display hardware are stable with respect to remote perturbation processes. It is possible to examine partially the validity of these assumptions with suitable hardware redundancy. We plan to record the raw noise data prior to analysis, and to record the feedback display on video tape during the experiment, using the second channel of the display facility. After the participant has left the area, a comparison can be made between the actual display during the experiment and the display which is now generated from the recorded raw data of the experiment. If there is a disagreement, we are able to isolate the pertubation to the analysis display (as opposed to source) hardware. An agreement between the two displays is an indication that the initial assumptions are valid.

III PARTICIPANTS

A. Selection Criteria

Missile Research and Development Command (MIRADCOM), Army Materiel System Analysis Agency (AMSAA), and SRI International have individuals who are presently, or have past experience in, participating in remote viewing experiments. The MIRADCOM and AMSAA participants are government employees. The SRI participants are consultants or members of the SRI staff and will work if selected in a contractural arrangement. Only those individuals who indicate a positive desire to participate, after familiarization with the remote perturbation experiments and procedures, will be accepted into the RP program. An information and consent form is included below (Section D).

In addition to willingness to participate, special attention will be paid to enlisting the support and participation of those subjects who have already demonstrated ability in the area of remote viewing.

B. Experiment Duration

The total duration of the investigation is 6 months. Experiment sessions will take place during the normal work week and will not exceed 1/2 hour length each. There will be no more than 2 sessions per day, one in the morning and one in the afternoon.

C. Number of Participants

We plan to seek only experienced remote viewers to participate in this investigation, and we expect to work with no more than nine individuals. All participants are to be in general good health, as determined by a standard employment physical examination.

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D.

VOLUNTEER CONSENT FORM

I, ________________________________, SSN ________________,
having attained my eighteenth (18th) birthday, and otherwise having full capacity to consent, do hereby volunteer to participate in this program to determine the nature, and possible applications of inherent psychic abilities. The following items have been explained to me by, ________________________, and are set forth on the reverse side of this agreement, which I have initialed.

a. The nature, duration, purposes, and expected benefits of the program in which I will be participating.

b. The methods and means by which the program is to be conducted; any methods and means that are experimental will be identified as such.

c. The inconveniences, hazards, discomforts, risks or other effects on my health or person which may possibly come from my participation in the program.

d. The alternative procedures, if any, that might be employed to protect or further my health and well-being. I have been given an opportunity to ask questions concerning this project and any such questions have been answered to my full and complete satisfaction. I understand that I may at any time during the course of this project revoke my consent and withdraw from the study without prejudice; however, I may be requested to undergo certain further examinations, if, in the opinion of a qualified physician, such examinations are necessary for my health or well-being.

________________________________ ________________
(Name) (Date)

I was present during the explanation referred to above, as well as the volunteer's opportunity for questions, and hereby witness his signature. I am not involved in the program in any way.

________________________________ ________________
(Name) (Date)

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1. <u>Explanation of the Experiments</u>. The purpose of these experiments is to determine the extent to which a person is able to mentally perturb or affect sensitive electronic equipment. In this case a random number generator will control a variety of different video displays generated by a small computer. Your interaction with the computer is to be by mental means alone. You will be asked to try to make changes in the video display; or, in biofeedback terminology, to use passive volition to produce the desired change. We are naming this interaction between a person and a remote system remote perturbation, or RP for short. We are endeavoring to both foster and understand these abilities.

In the course of these experiments, no drugs, hypnosis, psychopharmacological agents of any kind or subliminal stimulation will be used.

2. <u>Explanation of the Procedures</u>. You will be asked to sit in a comfortably appointed environment on Redstone Arsenal(see Figure 6). A video display will be present which you may attend to if you wish. In the course of a half-hour session, a number of electronically controlled runs will be carried out, in which you will be asked to try to cause a change on the video monitor, by an act of will. You will receive immediate feedback, if you wish, to assist you in gaining conscious control over the remote perturbation abilities we are examining. You will be asked to participate in no more than one half-hour session in the morning, and one half-hour session in the afternoon. At any time you may decline to take part in either session, without prejudice to your continued participation in the program.

3. <u>Description of Reasonably-Expected Inconveniences, Hazards, Discomfort, Risks, or Other Effects</u>. There is no known evidence for any adverse effects or risks associated with participation in research of this type. Investigations such as these have been carried out in laboratories for almost a hundred years in the United States and England, and there is no record of any type of hazard or discomfort to a participating subject.

4. <u>Description of Any Alternative Procedure that Might be Employed to Protect the Subject's Health</u>. There is no known risk to protect against.

5. <u>Description of Alternative Advantages to the Volunteer</u>. He has opportunity to gain conscious control over otherwise latent or unconscious processes within himself.

6. <u>Questions Posed by Volunteer--and Answers.</u> (To be filled in.)

Volunteer will initial end of each of the above paragraphs.

E. Medical Facilities

1. Personal Injuries or Illnesses

General

When accidents occur involving personal injuries to project members or subjects, or when a project member or subject experiences a sudden onset of illness, the supervisor shall:

(1) Ensure that the project member or subject receives first aid and medical care immediately;

(2) If the accident or illness is serious enough to warrant additional assistance, dial 6-5854 for the emergency room, Fox Army Hospital, Redstone Arsenal, and, if necessary, 6-6110 for ambulance service to the hospital;

(3) Investigate the accident or illness, and prepare in duplicate an Accident/Illness Investigation Report. This report must be submitted to the Project Manager or his designee the same day. The Project Manager will sign the report and forward the original to Occupational Health, Bldg 7110, Redstone Arsenal, AL 35809.

Medical Assistance in Case of Injury

The Fox Army Hospital, Redstone Arsenal, has been designated to handle accident and illness cases occurring on-post at Redstone Arsenal. The emergency room service is available 24 hours a day, seven days a week.

2. Emergency Response Program

The Project Manager, or his designated alternate, is responsible for the preparation of the Emergency Program and the coordination of all emergency activities. He has complete authority to take whatever action

is necessary to protect human life or property in time of an emergency.

Procedure

In the event of, and depending on the type of emergency, the person involved will as soon as practical:

(1) Dial 117 for Fire Department

(2) Dial 6-6110 for ambulance service

(3) Dial 6-5854 for Medical Officer of the Day (Fox Army Hospital)

(4) While waiting for assistance and . . .

(a) if the injured person is bleeding profusely, the first aider should try to stop the flow of blood (e.g., direct pressure should be applied over the wound, and if necessary a tourniquet should be applied);

(b) if the injured or ill person is not breathing, the first aider should apply mouth-to-mouth resuscitation or whatever method he is most familiar with, in order to revive the injured person as soon as possible;

(c) if the injured or ill person is suffering from shock, he or she should be wrapped or covered with a blanket.

Emergency on post ambulance service may be obtained on a 24-hour basis. A driver and attendant will be present with each ambulance. These personnel will be familiar with and capable of operating the emergency life saving apparatus installed in the ambulance.

3. Insurance Coverage

Medical and Disability Benefits. Participants in the Remote Viewing activities will fall into three classes, with resulting differ-

ences in their insurance coverage.

SRI Employees (California). Their participation in the project will be as part of their employment at SRI. Therefore, if they sustain any injury or illness as a result of their participation in the project, they would be entitled to the benefits of Worker's Compensation Insurance, as prescribed by the State of California. These benefits include full medical treatment, reimbursement for lost wages (subject to statutory limitations), and awards for permanent disability, if any.

U.S. Government Employees. Their participation would be in the course of their employment with the U.S. Government, and so they would be entitled to the federal equivalent of Worker's Compensation Insurance benefits.

Individual Consultants. As independent contractors, consultants would not be covered by Worker's Compensation Insurance, nor would they be covered by any of the insurance benefits available to SRI employees or government employees. They would have to look to their own personal insurance for protection.

F. Debriefing Schedule

1. Session Debriefing

At the end of each experimental session, the subject will be given all the data available pertaining to that group of trials. Any statistical significance or lack thereof will also be clearly explained to him.

2. Experiment Debriefing

At the conclusion of experimental testing, a final unclassified report will be prepared, summarizing all results from the experiment, together with any conclusions or scientific findings that may have come out of the study. The report will be given to each participating subject. Finally, any remaining questions that the subjects may have about the experiment will be answered.

3. Specific Debriefing Protocols

We do not anticipate that participation in these experiments will have any effect on the day-to-day life of the subjects. This study is a purely intellectual activity, and we believe that the debriefing provided by the final technical report will be a suitable termination of the experiment for the subject.

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IV INVESTIGATION ANALYSIS CRITERIA

The first 4 months of the investigation will be used as a pilot period during which the participants will familiarize themselves with the experiment and explore various techniques in a learning mode. This period will also be used to optimize the device parameters. During the final two months of the investigation, each participant will be asked to contribute 100 runs. Using the analysis described above, we will determine the number of runs that had odds against chance expectation of greater than 20:1. If this total number of runs is greater than 10 (the number required by exact binomial calculation to meet odds against chance of greater than 20:1) then we will declare that participant to have a significant result. To assess whether the entire investigation is significant, we shall combine the results of the six participants using standard statistical procedures.[33]

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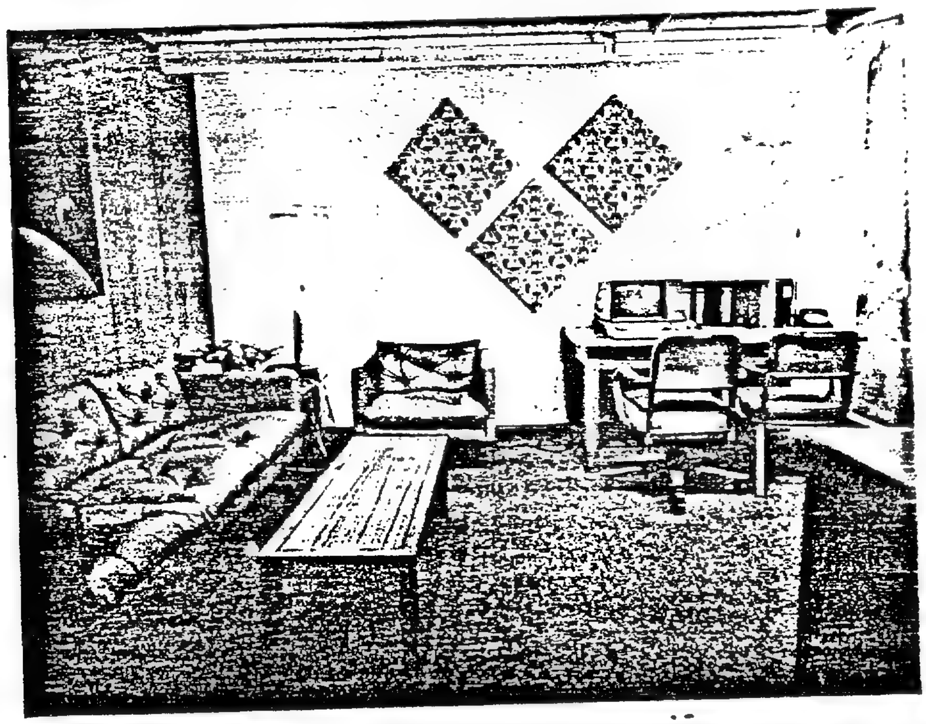
V ENVIRONMENT

The laboratory in which these experiments will be conducted is located on Redstone Arsenal, Alabama.

The room to be used for this work is a comfortable, carpeted, air-conditioned environment. It is lit by a combination of fluorescent and incandescent fixtures in the ceiling. There is a couch, an easy chair, and two tables. The computer graphics terminal stands on one of these tables. The participant will be seated on a conventional reclining swivel chair.



REFERENCES

1. H. E. Puthoff and R. Targ, "Physics, Entropy, and Psychokinesis," Proc. 23rd Annual International Conference, Quantum Physics and Parapsychology, Geneva, Switzerland (August 1974).

2. H. Schmidt, "A PK Test with Electronic Equipment," J. Parapsychology, Vol. 34, No. 3, pp. 175-181 (September 1970).

3. H. Schmidt, J. Parapsychology, Vol. 34, p 175 (1970).

4. H. Schmidt, J. Parapsychology, Vol. 34, p. 255 (1970).

5. H. Schmidt and L. Pantas, J. Parapsychology, Vol. 36, p. 222 (1972).

6. F. Matas and L. Pantas, Proc. Parapsychol. Assn., Vol. 8, p. 12 (1971).

7. E. Andre, J. Parapsychology, Vol. 36, p. 283 (1972).

8. C. Honorton and W. Barksdale, J. Amer. Soc. Psychical Research, Vol. 66, p. 208 (1972).

9. H. Schmidt, J. Parapsychology, Vol. 37, p. 105 (1973).

10. D. J. Bierman and J. M. Houtkeeper, European J. Parapsychology, Vol. 1, p. 3 (1975).

11. H. Schmidt, J. Amer. Soc. Psychical Research, Vol. 70, p. 267 (1976).

12. R. G. Stanford and C. Fox, Research in Parapsychology 1974, Vol. 61

13. R. G. Stanford, R. Zenhausern, A. Taylor, and M. Dwyer, J. Amer. Soc. Psychical Research, Vol. 69, p. 127 (1975).

14. W. G. Braud, G. Smith, K. Andrew, and S. Willis, Research in Parapsychology 1975, Vol. 85.

15. C. Honorton and E. C. May, Research in Parapsychology 1975, Vol. 90.

16. E. C. May and C. Honorton, Research in Parapsychology 1975, Vol. 88.

17. B. Millar and R. Broughton, Research in Parapsychology 1975, Vol. 83.

18. B. Millar and J. Mackenzie, Research in Parapsychology 1976, Vol. 23.

19. B. Millar, Parapsychology Assoc. Meeting 1977.

20. C. Honorton and R. Winnett, Research in Parapsychology 1976, Vol. 97

21. R. Winnett and C. Honorton, Research in Parapsychology 1976, Vol. 95.

22. W. G. Braud and J. Hartgrove, Parapsychology Assoc. Meeting 1977.

23. R. Broughton, et al, Research in Parapsychology 1977, Vol. 41.

24. W. G. Braud, Parapsychology Assoc. Meeting 1976.

25. H. Schmidt, Research in Parapsychology 1977.

26. J. Terry and H. Schmidt, Research in Parapsychology 1977, Vol. 36

27. J. Jungerman and R. Jungerman, Research in Parapsychology 1977, Vol. 157.

28. J. Davis and R. Morrison, Research in Parapsychology 1977, Vol. 163.

29. L. W. Braud and W. G. Braud, Research in Parapsychology 1977, Vol. 135.

30. R. H. Haitz, "Controlled Noise Generation with Avalanch Diodes," IEEE Transactions on Electron Devices, Vol. ED-13, No. 3, pp. 342-346 (March 1966).

31. A. Wald, Sequential Analysis, Dover Publications, Inc., New York (1973).

32. M. Fisz, Probability Theory and Mathematical Statistics, John Wiley & Sons, Inc., pp. 584-611, New York (1973).

33. R. Rosenthal, "Combining Results of Independent Studies," Psychological Bulletin, 1978, Vol. 85, No. 1, pp. 185-193.

Appendix A

A PK TEST WITH ELECTRONIC EQUIPMENT

by H. Schmidt

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ABSTRACT: The subjects in this research were tested for their psychokinetic ability by means of an electronic apparatus made up of a random number generator (RNG) connected with a display panel. The RNG produced random sequences of two numbers which were determined by a simple quantum process (the decay of radioactive strontium-90 nuclei). The essential aspect of the display panel was a circle of nine lamps which lighted one at a time in the clockwise (+1) direction or the counterclockwise (−1) direction depending on which of the two numbers the RNG produced. The subject's task was to choose either the clockwise or counterclockwise motion and try by PK to make the light proceed in that direction.

One run was made up of 128 "jumps" of the light, and there were four runs per session. In a preliminary series of 216 runs, the 18 subjects had a negative deviation of 129 hits. Accordingly, the main series was expected to give negative scores, and a negative attitude was encouraged among the subjects. Fifteen subjects carried out 256 runs, with a significant negative deviation of 302 hits ($P = .001$).

The RNG was checked for randomness throughout the experiment and was found to be adequate.—Ed.

In previous work (4, 5) the author was able to get significant evidence of precognition in which the testing apparatus was an electronic device based on a simple quantum process. The present experiment was an attempt to get significant evidence of psychokinesis by the use of a similar apparatus.

The basic part of the apparatus was a binary random number generator which produced the numbers "+1" and "−1" in random sequence, and the general objective was to have the subjects try to mentally influence the generator to produce one of the two numbers more frequently than the other.

The most easily available random generators, which have been used in many PK experiments, are a rolled die and a flipped coin. In comparison with these, an electronic random generator, the operation of which most of the subjects cannot understand, may at first thought seem psychologically unfavorable. Results of experiments with complex targets (3, p. 142), however, suggest that PK is goal oriented in the sense that results can be obtained by concentrating on the goal only, no matter how complicated the intermediate steps may seem to the rationalizing mind. A definite advantage of an electronic apparatus is that it permits a psychologically challenging formulation of the goal. In the present experiment the random number generator (RNG) was connected with a display panel showing a circle of nine lamps. One lamp was lit at a time, and each generated "+1" or "−1" caused the light to jump one step in the clockwise or counterclockwise direction, respectively. The subjects were not asked to try to force the generator to produce more +1's than −1's but, rather, to force the light on the panel to make more jumps in one direction or the other. Both tasks are certainly equivalent, but the latter seems psychologically much more appealing to most subjects.

A further obvious advantage of electronic test equipment is that the detailed results can be automatically recorded and evaluated and that one can work, if desired, at high speeds.

The particular type of random generator used here was chosen partly for practical and partly for theoretical reasons. The sequence in which the random numbers are produced is determined by simple quantum processes, the decays of radioactive strontium-90 nuclei. The electrons emitted in this decay trigger a Geiger counter, and the random times at which electrons are registered at the Geiger counter decide the generated numbers. Practically, the generator is easy to build, and the randomness of the generated numbers has been found to be very good. Furthermore, the simplicity of the generator allows a complete theoretical discussion (6) of its randomness properties; and in addition, one can say fairly well at which point the random element in the number generation comes in. The generator is essentially deterministic except for the random decay times of the nuclei.

The use of simple quantum jumps to provide randomness is, for

the theorist, a rather natural choice, since these processes are assumed by physicists to be nature's most elementary source of randomness, and some psi tests utilizing quantum processes have already been reported (1, 2). Certainly, the outcome of a die throw is also largely determined by microscopic quantum processes. The thermal vibrations of the surface and the air fluctuations at an atomic level co-determine the generated die face. The process in this case is much more complicated, however, since many more factors contribute to the end result.

Apparatus

The test equipment consisted of a binary random number generator and a display panel.

Random Number Generator

The RNG, which was similar to the one described in connection with earlier precognition experiments (4, 5, 6), can produce sequences of binary random numbers of any specified length. Electrons emitted by the strontium-90 decay trigger a Geiger counter and the momentary position of a binary high frequency counter at the time of the electron registration determines whether a "+1" or a "−1" is generated.

The numbers of electrical pulses produced on the +1 output and the −1 output are recorded by two electromechanical reset counters, and the complete sequence of generated numbers is recorded on paper punch tape.

Randomness Tests

Because of the simplicity of the circuitry, the degree of randomness to be expected of the RNG can be discussed in detail (6) and it can be shown to be much greater than required by the experiment.

The electronic circuitry is designed so that variations in the characteristics of the components cannot impair the randomness. In order to guard against any gross malfunctions, the proper electronic operation was tested frequently. Furthermore, the randomness of the generated number sequence was tested experimentally. For this purpose, a sequence of four million numbers, generated on many

different days, was recorded on paper tape. Then for the whole sequence the numbers N^+, N^- of generated +1's and −1's were counted and were found to be consistent with randomness, as was the total number of flips (F); i.e., events where a +1 was followed by a −1 or vice versa. The same procedure was applied to the 400 number sequences obtained by cutting the whole sequence into blocks of 10,000 numbers each. A goodness-of-fit test verified that the 400 values for +1 and −1, and the 400 values for F were consistent with their expected normal distribution.

Display Panel

In testing with this apparatus, the two above-mentioned counters for the numbers of generated +1's and −1's could serve as the only display, i.e., the (visual) focusing point toward which the subject could have directed his PK efforts. In this case, the subject might try to enforce mentally on the +1 counter a higher number of counts than on the −1 counter. It seemed desirable, however, to use a psychologically more stimulating display in the form of a panel with nine lamps arranged in a circle and connected to the RNG by a 30-foot long cable. One of the nine lamps was lighted at a time; and each time the RNG produced a signal, the light advanced one step in the clockwise or the counterclockwise direction according to whether the signal came to the +1 or the −1 output. Thus the light performed a "random walk" among the nine lamps. Rather than direct his PK toward the counters, then, the subject generally tried to "will" the light on the display panel to advance in an overall clockwise motion.

Some of the subjects, however, preferred to force the light in the counterclockwise direction. For them the two signal wires from the RNG to the display panel were interchanged by flipping a switch on the display panel so that a count on the +1 counter was displayed as a jump of the light in the counterclockwise direction. Thus, for all subjects, a jump of the lamp in the preferred direction, whether clockwise or counterclockwise, was registered on the +1 counter.

Test Procedure

The subjects in this experiment were members of the Institute for Parapsychology plus a few visitors. During a test session, the

subject sat in a dark closet with the display panel in front of him. The RNG and the experimenter were stationed in the room outside the closet.

Each testing session comprised 4 runs of 128 counts (steps in the random walk). A run took approximately two minutes. The machine stopped automatically after the one hundred and twenty-eighth count. There were short breaks, mostly between one-half and two minutes, between the runs.

At the beginning of each run, the subject, having decided in which direction (clockwise or counterclockwise) he wanted to influence the light to go, set a switch on the panel accordingly. Then the experimenter turned on the start switch, causing the RNG to generate 128 random numbers. At the end of each run, the experimenter recorded the readings of the +1 counter and −1 counter. The correctness of the counter readings was later checked with the sequence of generated numbers recorded on the paper punch tape.

From the experimenter's point of view, the subject's goal was always to produce a high number of +1 counts. From the subject's viewpoint the equivalent goal was to influence the light in the direction desired and indicated by the position of the switch on the display panel.

The subject was permitted to flip the switch during the course of a run so as to change the direction in which he wanted the hits displayed, but only a few subjects actually took advantage of the opportunity. With this arrangement, the subject could have had the impression that he was doing a test in precognition (by setting the switch in the direction in which he thought the light would move on the next jump) while he was actually doing a PK test.

Preliminary Series

There were 18 subjects in the preliminary series and they carried out a total of 54 sessions, each subject contributing from one to seven sessions.

The total score was a negative deviation of 129 hits below chance expectation out of 216 runs; $CR = 1.55$. These results include one subject who obtained a high positive score of 52 hits above chance in 16 runs ($CR = 2.3$).

Main Series

It was expected on the basis of the preliminary results that by leaving out the one high-scoring subject, an overall significantly negative score would be obtained in the main series. In order to emphasize the negative scoring, some subjects were asked to associate feelings of pessimism and failure with the experiment. The more negative-scoring subjects were used more frequently, and a few new subjects were allowed to contribute only after preliminary tests had suggested a negative scoring tendency.

The total length of the experiment was set in advance at 64 sessions of four runs each. It was not determined in advance, however, how many sessions each individual subject should contribute. Altogether there were 15 subjects and they contributed between one and 10 sessions each.

Although the proper randomness of the generator had been tested extensively, as mentioned before, a further safeguard against a possible bias of the generator was introduced. After the first half of the confirmatory test was completed the two outputs of the generator were internally interchanged. Thus, even a constant bias in the generator could not have caused the total significant score to be reported.

A total of 256 runs in this part of the experiment yielded a negative deviation of 302 hits ($CR = 3.33$; $P < .001$, two-tailed). Of the 64 sessions, 46 gave below-chance scores, 15 above-chance scores, and three were just at chance level ($CR = 4.0$). Of the 256 runs, 147 were below chance, 92 above chance, and 17 at chance level ($CR = 3.55$). These three CR values are certainly not independent, but they do emphasize the consistency of the results.

A post hoc analysis of the data showed two types of decline effect: more negative scoring in the second half of each run than in the first; and more negative scoring in the second half (the third and fourth runs) of each session than in the first half (first two runs). The decline results, however, are suggestive rather than statistically significant:

Deviation for pooled first half of the run: —91
Deviation for pooled second half of the run: —211
Deviation for the pooled first half of the session: —83
Deviation for the pooled second half of the session: —219

Discussion

The result of the experiment shows that the binary random number generator had no bias for generation of +1's or −1's as long as it was left unattended (in the randomness tests) but that it displayed a significant bias when the test subjects concentrated on the display panel, wishing for an increased generation rate of one number.

The experiment has been discussed in terms of PK, but in principle the result could certainly also be ascribed to precognition on the part of the experimenter or the subject. Since the sequence of generated numbers depended critically on the time when the test run began, and since the experimenter, in consensus with the subject, decided when to flip the start switch, precognition might have prompted experimenter and subject to start the run at a time which favored scoring in a certain direction.

If the PK interpretation is appropriate, the results imply the action of PK at some distance, since the generator was separated from the subject by a wall and only the display panel was close to the subject.

References

1. Beloff, J., and Evans, L. A radioactivity test of psychokinesis. *J. Soc. psych. Res.*, 1961, 41, 41-46.
2. Chauvin, R., and Genthon, J. Eine Untersuchung über die Möglichkeit psychokinetischer Experimente mit Uranium und Geigerzähler [An investigation of the possibility of PK experiments with uranium and a Geiger counter]. *Zeitschrift für Parapsychologie und Grenzgebiete der Psychologie*, 1965, 8, 140-47.
3. Rhine, L. E. *Mind Over Matter*. New York: Macmillan, 1970.
4. Schmidt, H. Anomalous prediction of quantum processes by some human subjects. Document D1-82-0821 (1969). Boeing Scientific Research Laboratories, Seattle, Washington. Available from Clearing House, U.S. Dept. Commerce, Springfield, Va.
5. Schmidt, H. Precognition of a quantum process. *J. Parapsychol.*, 1969, 33, 99-108.
6. Schmidt, H. Quantum-mechanical random-number generator. *J. app. Physics*, 1970, 41 (No. 2), 462-68.

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